

# Exhibit 7

**U.S. Patent No. 7,450,507 (“507 Patent”)****Exemplary Accused Product**

NetApp products, including at least each of the following products (and their variations) infringe at least Claim 1 of the '507 Patent: NetApp ONTAP 9.4 (and later versions) operating system and data management software. The infringement chart below is based on the NetApp ONTAP 9.4 operating system and data management software (“ONTAP Management Software”), which is exemplary of the infringement of the '507 Patent.

Claims	ONTAP Management Software
[1pre]. A method for rate-limiting a traffic stream using a rate-limit hierarchy at a network node comprising:	ONTAP Management Software performs a method for rate-limiting a traffic stream using a rate-limit hierarchy at a network node.

## Guaranteeing throughput with QoS

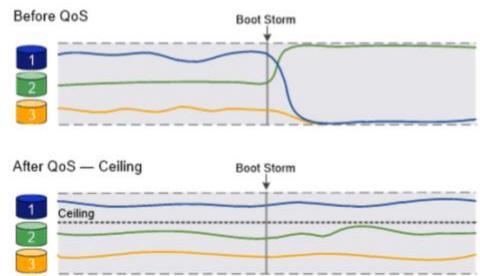
You can use storage quality of service (QoS) to guarantee that performance of critical workloads is not degraded by competing workloads. You can set a throughput *ceiling* on a competing workload to limit its impact on system resources, or set a throughput *floor* for a critical workload, ensuring that it meets minimum throughput targets, regardless of demand by competing workloads. You can even set a ceiling and floor for the same workload.

### Understanding throughput ceilings (QoS Max)

A throughput ceiling limits throughput for a workload to a maximum number of IOPS, MB/s, or IOPS, MB/s. In the figure below, the throughput ceiling for workload 2 ensures that it does not "bully" workloads 1 and 3.

A *policy group* defines the throughput ceiling for one or more workloads. A workload represents the I/O operations for a *storage object*: a volume, file, or LUN, or all the volumes, files, or LUNs in an SVM. You can specify the ceiling when you create the policy group, or you can wait until after you monitor workloads to specify it.

**Note:** Throughput to workloads might exceed the specified ceiling by up to 10 percent, especially if a workload experiences rapid changes in throughput. The ceiling might be exceeded by up to 50% to handle bursts. Bursts occur on single nodes when tokens accumulate up to 150%.

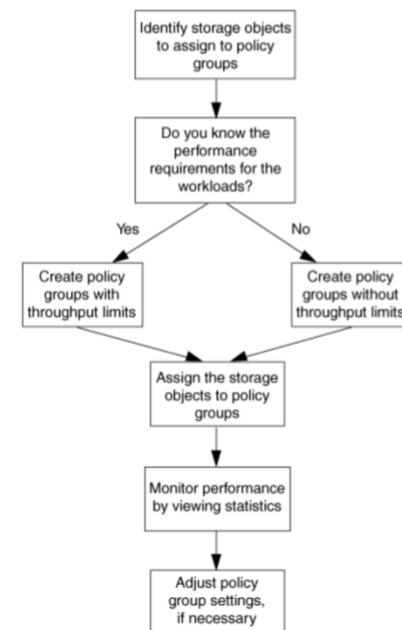


<https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perfmon%2FGUID-B144F39A-2E14-4048-91CA-D8080C50F70D.html>.

	<h2>Setting a throughput ceiling with QoS</h2> <p>You can use the <code>max-throughput</code> field for a policy group to define a throughput ceiling for storage object workloads (QoS Max). You can apply the policy group when you create or modify the storage object.</p> <p><b>Before you begin</b></p> <ul style="list-style-type: none"> <li>• You must be a cluster administrator to create a policy group.</li> <li>• You must be a cluster administrator to apply a policy group to an SVM.</li> </ul> <p><b>About this task</b></p> <ul style="list-style-type: none"> <li>• Starting with ONTAP 9.4, you can use a <i>non-shared</i> QoS policy group to specify that the defined throughput ceiling applies to each member workload individually. Otherwise, the policy group is <i>shared</i>: the total throughput for the workloads assigned to the policy group cannot exceed the specified ceiling.</li> </ul> <p>Set <code>-is-shared=false</code> for the <code>qos policy-group create</code> command to specify a non-shared policy group.</p> <ul style="list-style-type: none"> <li>• You can specify the throughput limit for the ceiling in IOPS, MB/s, or IOPS, MB/s. If you specify both IOPS and MB/s, whichever limit is reached first is enforced.</li> </ul> <hr/> <p><b>Note:</b> If you set a ceiling and a floor for the same workload, you can specify the throughput limit for the ceiling in IOPS only.</p> <hr/> <ul style="list-style-type: none"> <li>• A storage object that is subject to a QoS limit must be contained by the SVM to which the policy group belongs. Multiple policy groups can belong to the same SVM.</li> <li>• You cannot assign a storage object to a policy group if its containing object or its child objects belong to the policy group.</li> <li>• It is a QoS best practice to apply a policy group to the same type of storage objects.</li> </ul> <p><a href="https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perfmon%2FGUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html">https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perfmon%2FGUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html</a>.</p>
[1a] subjecting a packet to a first rate-limit check, said first rate-limit check corresponding to a first-level traffic classification;	ONTAP Management Software subjects a packet to a first rate-limit check where the first rate-limit check corresponds to a first-level traffic classification. For example, by classifying storage object workloads under policy groups and subjecting data packets to a first rate-limit check of the policy group.

## Storage QoS workflow

If you already know the performance requirements for the workloads you want to manage with QoS, you can specify the throughput limit when you create the policy group. Otherwise, you can wait until after you monitor the workloads to specify the limit.



<https://docs.netapp.com/ontap-9/index.jsp?topic=/com.netapp.doc.pow-perfmon/GUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html>.

## Guaranteeing throughput with QoS

You can use storage quality of service (QoS) to guarantee that performance of critical workloads is not degraded by competing workloads. You can set a throughput *ceiling* on a competing workload to limit its impact on system resources, or set a throughput *floor* for a critical workload, ensuring that it meets minimum throughput targets, regardless of demand by competing workloads. You can even set a ceiling and floor for the same workload.

### Understanding throughput ceilings (QoS Max)

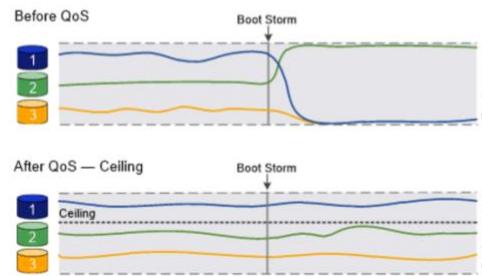
A throughput ceiling limits throughput for a workload to a maximum number of IOPS, MB/s, or IOPS, MB/s. In the figure below, the throughput ceiling for workload 2 ensures that it does not "bully" workloads 1 and 3.

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**Note:** Throughput to workloads might exceed the specified ceiling by up to 10 percent, especially if a workload experiences rapid changes in throughput. The ceiling might be exceeded by up to 50% to handle bursts. Bursts occur on single nodes when tokens accumulate up to 150%

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## Setting a throughput ceiling with QoS

You can use the **max-throughput** field for a policy group to define a throughput ceiling for storage object workloads (QoS Max). You can apply the policy group when you create or modify the storage object.

### Before you begin

- You must be a cluster administrator to create a policy group.
- You must be a cluster administrator to apply a policy group to an SVM.

### About this task

- Starting with ONTAP 9.4, you can use a *non-shared* QoS policy group to specify that the defined throughput ceiling applies to each member workload individually. Otherwise, the policy group is *shared*: the total throughput for the workloads assigned to the policy group cannot exceed the specified ceiling.

Set **-is-shared=false** for the **qos policy-group create** command to specify a non-shared policy group.

- You can specify the throughput limit for the ceiling in IOPS, MB/s, or IOPS, MB/s. If you specify both IOPS and MB/s, whichever limit is reached first is enforced.

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**Note:** If you set a ceiling and a floor for the same workload, you can specify the throughput limit for the ceiling in IOPS only.

- A storage object that is subject to a QoS limit must be contained by the SVM to which the policy group belongs. Multiple policy groups can belong to the same SVM.
- You cannot assign a storage object to a policy group if its containing object or its child objects belong to the policy group.
- It is a QoS best practice to apply a policy group to the same type of storage objects.

<https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perfmon%2FGUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html>.

### Understanding shared and non-shared QoS policy groups

Starting with ONTAP 9.4, you can use a *non-shared* QoS policy group to specify that the defined throughput ceiling or floor applies to each member workload individually. Behavior of *shared* policy groups depends on the policy type:

- For throughput ceilings, the total throughput for the workloads assigned to the shared policy group cannot exceed the specified ceiling.
- For throughput floors, the shared policy group can be applied to a single workload only.

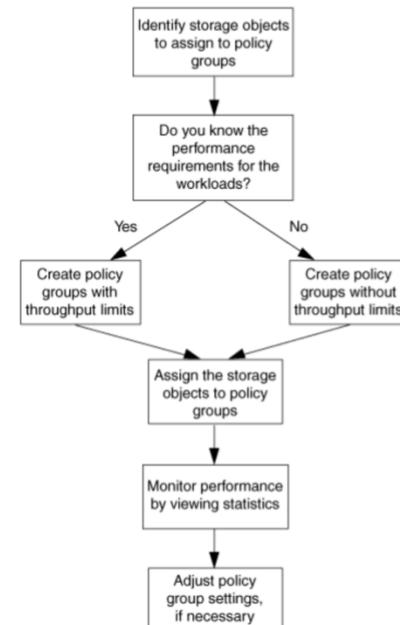
	<p><a href="https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perf-mon%2FGUID-B144F39A-2E14-4048-91CA-D8080C50F70D.html">https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perf-mon%2FGUID-B144F39A-2E14-4048-91CA-D8080C50F70D.html</a>.</p> <p><b>Steps</b></p> <ol style="list-style-type: none"> <li>1. Create a policy group:</li> </ol> <pre><code>qos policy-group create -policy group policy_group -vserver SVM -max-throughput number_of_iops Mb/S iops,Mb/S -is-shared true false</code></pre> <p>For complete command syntax, see the man page. You can use the <code>qos policy-group modify</code> command to adjust throughput ceilings.</p> <p><b>Example</b></p> <p>The following command creates the shared policy group <code>pg-vs1</code> with a maximum throughput of 5,000 IOPS:</p> <pre><code>cluster1::&gt; qos policy-group create -policy group pg-vs1 -vserver vs1 -max-throughput 5000iops -is-shared true</code></pre> <p><b>Example</b></p> <p>The following command creates the non-shared policy group <code>pg-vs3</code> with a maximum throughput of 100 IOPS or 400 Kb/S:</p> <pre><code>cluster1::&gt; qos policy-group create -policy group pg-vs3 -vserver vs3 -max-throughput 100iops,400KB/s -is-shared false</code></pre> <p><b>Example</b></p> <p>The following command creates the non-shared policy group <code>pg-vs4</code> without a throughput limit:</p> <pre><code>cluster1::&gt; qos policy-group create -policy group pg-vs4 -vserver vs4 -is-shared false</code></pre> <ol style="list-style-type: none"> <li>2. Apply a policy group to an SVM, file, volume, or LUN:</li> </ol> <pre><code>storage_object create -vserver SVM -qos-policy-group policy_group</code></pre> <p>For complete command syntax, see the man pages. You can use the <code>storage_object modify</code> command to apply a different policy group to the storage object.</p> <p><b>Example</b></p> <p>The following command applies policy group <code>pg-vs1</code> to SVM <code>vs1</code>:</p> <pre><code>cluster1::&gt; vserver create -vserver vs1 -qos-policy-group pg-vs1</code></pre> <p><b>Example</b></p> <p>The following commands apply policy group <code>pg-app</code> to the volumes <code>app1</code> and <code>app2</code>:</p> <pre><code>cluster1::&gt; volume create -vserver vs2 -volume app1 -aggregate aggr1 -qos-policy-group pg-app</code></pre> <pre><code>cluster1::&gt; volume create -vserver vs2 -volume app2 -aggregate aggr1 -qos-policy-group pg-app</code></pre> <p><a href="https://docs.netapp.com/ontap-9/index.jsp?topic=/com.netapp.doc.pow-perf-mon/GUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html">https://docs.netapp.com/ontap-9/index.jsp?topic=/com.netapp.doc.pow-perf-mon/GUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html</a></p>
<p>[1b] subjecting said packet to a second rate-limit check and an infinity rate-limit check, said second rate-limit check and said infinity rate-limit check</p>	<p>ONTAP Management Software subjects a packet to a second rate-limit check and an infinity rate-limit check where the second rate-limit check and infinity rate-limit check corresponds to a second-level traffic classification. For example, the traffic policy classifies storage object workloads and subjects data packets to a second rate-limit</p>

corresponding to a second-level traffic classification;

check and an infinity rate-limit check, e.g., set by the policy group throughput ceiling setting for a non-shared QoS policy group.

## Storage QoS workflow

If you already know the performance requirements for the workloads you want to manage with QoS, you can specify the throughput limit when you create the policy group. Otherwise, you can wait until after you monitor the workloads to specify the limit.



<https://docs.netapp.com/ontap-9/index.jsp?topic=/com.netapp.doc.pow-perf-mon/GUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html>.

## Guaranteeing throughput with QoS

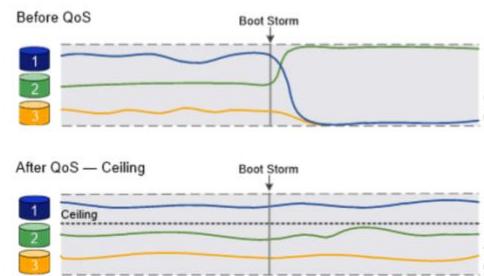
You can use storage quality of service (QoS) to guarantee that performance of critical workloads is not degraded by competing workloads. You can set a throughput *ceiling* on a competing workload to limit its impact on system resources, or set a throughput *floor* for a critical workload, ensuring that it meets minimum throughput targets, regardless of demand by competing workloads. You can even set a ceiling and floor for the same workload.

### Understanding throughput ceilings (QoS Max)

A throughput ceiling limits throughput for a workload to a maximum number of IOPS, MB/s, or IOPS, MB/s. In the figure below, the throughput ceiling for workload 2 ensures that it does not "bully" workloads 1 and 3.

A *policy group* defines the throughput ceiling for one or more workloads. A workload represents the I/O operations for a *storage object*: a volume, file, or LUN, or all the volumes, files, or LUNs in an SVM. You can specify the ceiling when you create the policy group, or you can wait until after you monitor workloads to specify it.

**Note:** Throughput to workloads might exceed the specified ceiling by up to 10 percent, especially if a workload experiences rapid changes in throughput. The ceiling might be exceeded by up to 50% to handle bursts. Bursts occur on single nodes when tokens accumulate up to 150%



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## Setting a throughput ceiling with QoS

You can use the **max-throughput** field for a policy group to define a throughput ceiling for storage object workloads (QoS Max). You can apply the policy group when you create or modify the storage object.

### Before you begin

- You must be a cluster administrator to create a policy group.
- You must be a cluster administrator to apply a policy group to an SVM.

### About this task

- Starting with ONTAP 9.4, you can use a *non-shared* QoS policy group to specify that the defined throughput ceiling applies to each member workload individually. Otherwise, the policy group is *shared*: the total throughput for the workloads assigned to the policy group cannot exceed the specified ceiling.

Set **-is-shared=false** for the **qos policy-group create** command to specify a non-shared policy group.

- You can specify the throughput limit for the ceiling in IOPS, MB/s, or IOPS, MB/s. If you specify both IOPS and MB/s, whichever limit is reached first is enforced.

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**Note:** If you set a ceiling and a floor for the same workload, you can specify the throughput limit for the ceiling in IOPS only.

- A storage object that is subject to a QoS limit must be contained by the SVM to which the policy group belongs. Multiple policy groups can belong to the same SVM.
- You cannot assign a storage object to a policy group if its containing object or its child objects belong to the policy group.
- It is a QoS best practice to apply a policy group to the same type of storage objects.

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### Understanding shared and non-shared QoS policy groups

Starting with ONTAP 9.4, you can use a *non-shared* QoS policy group to specify that the defined throughput ceiling or floor applies to each member workload individually. Behavior of *shared* policy groups depends on the policy type:

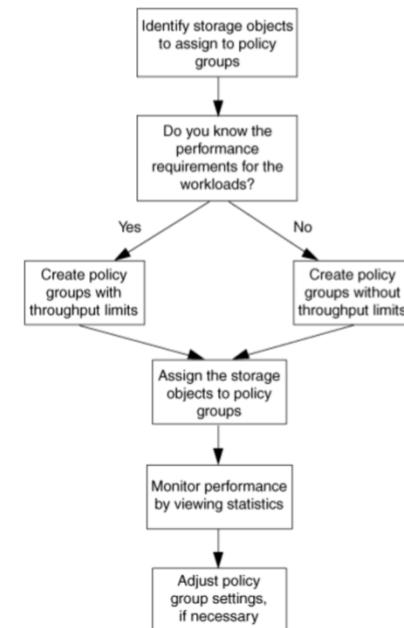
- For throughput ceilings, the total throughput for the workloads assigned to the shared policy group cannot exceed the specified ceiling.
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[1c] granting an automatic pass to said packet from said infinity rate-limit check regardless of whether or not said packet passes said second rate-limit check; and	ONTAP Management Software grants an automatic pass to the data packet from the infinity rate-limit check regardless of whether or not the data packet passes the second rate-limit check. For example, the storage object workloads can be configured where in the situation the remaining bandwidth for the policy group is not utilized by other

storage object workloads, the storage object workload at issue may receive an automatic pass from the infinity rate-limit check and use the remaining bandwidth of the policy group, even if it has reached its individual throughput ceiling.

## Storage QoS workflow

If you already know the performance requirements for the workloads you want to manage with QoS, you can specify the throughput limit when you create the policy group. Otherwise, you can wait until after you monitor the workloads to specify the limit.



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## Guaranteeing throughput with QoS

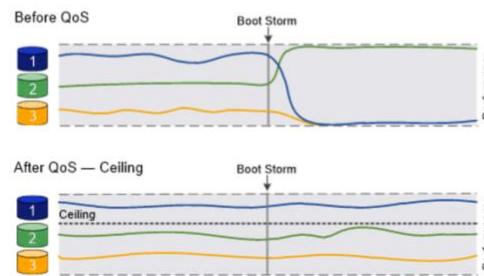
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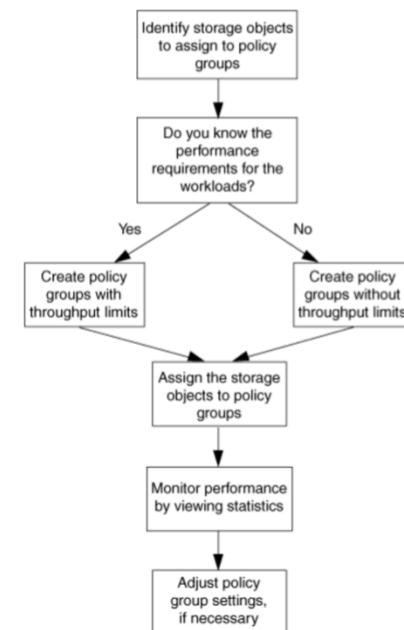
- For throughput ceilings, the total throughput for the workloads assigned to the shared policy group cannot exceed the specified ceiling.
- For throughput floors, the shared policy group can be applied to a single workload only.

	<p><a href="https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perf-mon%2FGUID-B144F39A-2E14-4048-91CA-D8080C50F70D.html">https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perf-mon%2FGUID-B144F39A-2E14-4048-91CA-D8080C50F70D.html</a>.</p> <p><b>Steps</b></p> <ol style="list-style-type: none"> <li>1. Create a policy group:</li> </ol> <pre><code>qos policy-group create -policy group policy_group -vserver SVM -max-throughput number_of_iops Mb/S iops,Mb/S -is-shared true false</code></pre> <p>For complete command syntax, see the man page. You can use the <code>qos policy-group modify</code> command to adjust throughput ceilings.</p> <p><b>Example</b></p> <p>The following command creates the shared policy group <code>pg-vs1</code> with a maximum throughput of 5,000 IOPS:</p> <pre><code>cluster1::&gt; qos policy-group create -policy group pg-vs1 -vserver vs1 -max-throughput 5000iops -is-shared true</code></pre> <p><b>Example</b></p> <p>The following command creates the non-shared policy group <code>pg-vs3</code> with a maximum throughput of 100 IOPS or 400 Kb/S:</p> <pre><code>cluster1::&gt; qos policy-group create -policy group pg-vs3 -vserver vs3 -max-throughput 100iops,400KB/s -is-shared false</code></pre> <p><b>Example</b></p> <p>The following command creates the non-shared policy group <code>pg-vs4</code> without a throughput limit:</p> <pre><code>cluster1::&gt; qos policy-group create -policy group pg-vs4 -vserver vs4 -is-shared false</code></pre> <ol style="list-style-type: none"> <li>2. Apply a policy group to an SVM, file, volume, or LUN:</li> </ol> <pre><code>storage_object create -vserver SVM -qos-policy-group policy_group</code></pre> <p>For complete command syntax, see the man pages. You can use the <code>storage_object modify</code> command to apply a different policy group to the storage object.</p> <p><b>Example</b></p> <p>The following command applies policy group <code>pg-vs1</code> to SVM <code>vs1</code>:</p> <pre><code>cluster1::&gt; vserver create -vserver vs1 -qos-policy-group pg-vs1</code></pre> <p><b>Example</b></p> <p>The following commands apply policy group <code>pg-app</code> to the volumes <code>app1</code> and <code>app2</code>:</p> <pre><code>cluster1::&gt; volume create -vserver vs2 -volume app1 -aggregate aggr1 -qos-policy-group pg-app</code></pre> <pre><code>cluster1::&gt; volume create -vserver vs2 -volume app2 -aggregate aggr1 -qos-policy-group pg-app</code></pre> <p><a href="https://docs.netapp.com/ontap-9/index.jsp?topic=/com.netapp.doc.pow-perf-mon/GUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html">https://docs.netapp.com/ontap-9/index.jsp?topic=/com.netapp.doc.pow-perf-mon/GUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html</a>.</p>
<p>[1d] granting an overall pass of said rate-limit hierarchy if said packet passes said first rate-limit check, even if said packet fails said second rate-limit check.</p>	<p>ONTAP Management Software grants an overall pass of the rate-limit hierarchy if the data packet passes the first rate-limit check, even if the data packet failed the second rate-limit check. For example, the storage object workload can be configured where in the situation the remaining bandwidth for the policy group is not utilized by other</p>

storage object workloads, the storage object workload at issue may receive an automatic pass from the infinity rate-limit check and use the remaining bandwidth of the policy group, even if it has reached its individual throughput ceiling.

## Storage QoS workflow

If you already know the performance requirements for the workloads you want to manage with QoS, you can specify the throughput limit when you create the policy group. Otherwise, you can wait until after you monitor the workloads to specify the limit.



<https://docs.netapp.com/ontap-9/index.jsp?topic=/com.netapp.doc.pow-perfmon/GUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html>

## Guaranteeing throughput with QoS

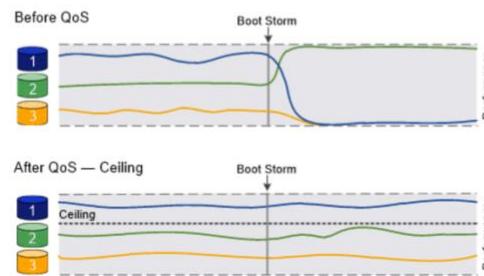
You can use storage quality of service (QoS) to guarantee that performance of critical workloads is not degraded by competing workloads. You can set a throughput *ceiling* on a competing workload to limit its impact on system resources, or set a throughput *floor* for a critical workload, ensuring that it meets minimum throughput targets, regardless of demand by competing workloads. You can even set a ceiling and floor for the same workload.

### Understanding throughput ceilings (QoS Max)

A throughput ceiling limits throughput for a workload to a maximum number of IOPS, MB/s, or IOPS, MB/s. In the figure below, the throughput ceiling for workload 2 ensures that it does not "bully" workloads 1 and 3.

A *policy group* defines the throughput ceiling for one or more workloads. A workload represents the I/O operations for a *storage object*: a volume, file, or LUN, or all the volumes, files, or LUNs in an SVM. You can specify the ceiling when you create the policy group, or you can wait until after you monitor workloads to specify it.

**Note:** Throughput to workloads might exceed the specified ceiling by up to 10 percent, especially if a workload experiences rapid changes in throughput. The ceiling might be exceeded by up to 50% to handle bursts. Bursts occur on single nodes when tokens accumulate up to 150%



<https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perfmon%2FGUID-B144F39A-2E14-4048-91CA-D8080C50F70D.html>.

## Setting a throughput ceiling with QoS

You can use the **max-throughput** field for a policy group to define a throughput ceiling for storage object workloads (QoS Max). You can apply the policy group when you create or modify the storage object.

### Before you begin

- You must be a cluster administrator to create a policy group.
- You must be a cluster administrator to apply a policy group to an SVM.

### About this task

- Starting with ONTAP 9.4, you can use a *non-shared* QoS policy group to specify that the defined throughput ceiling applies to each member workload individually. Otherwise, the policy group is *shared*: the total throughput for the workloads assigned to the policy group cannot exceed the specified ceiling.

Set **-is-shared=false** for the **qos policy-group create** command to specify a non-shared policy group.

- You can specify the throughput limit for the ceiling in IOPS, MB/s, or IOPS, MB/s. If you specify both IOPS and MB/s, whichever limit is reached first is enforced.

---

**Note:** If you set a ceiling and a floor for the same workload, you can specify the throughput limit for the ceiling in IOPS only.

- A storage object that is subject to a QoS limit must be contained by the SVM to which the policy group belongs. Multiple policy groups can belong to the same SVM.
- You cannot assign a storage object to a policy group if its containing object or its child objects belong to the policy group.
- It is a QoS best practice to apply a policy group to the same type of storage objects.

<https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perfmon%2FGUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html>.

### Understanding shared and non-shared QoS policy groups

Starting with ONTAP 9.4, you can use a *non-shared* QoS policy group to specify that the defined throughput ceiling or floor applies to each member workload individually. Behavior of *shared* policy groups depends on the policy type:

- For throughput ceilings, the total throughput for the workloads assigned to the shared policy group cannot exceed the specified ceiling.
- For throughput floors, the shared policy group can be applied to a single workload only.

<https://docs.netapp.com/ontap-9/index.jsp?topic=%2Fcom.netapp.doc.pow-perf-mon%2FGUID-B144F39A-2E14-4048-91CA-D8080C50F70D.html>.

**Steps**

1. Create a policy group:

```
qos policy-group create -policy group policy_group -vserver SVM -max-throughput number_of_iops|Mb/S|iops,Mb/S -is-shared true|false
```

For complete command syntax, see the man page. You can use the `qos policy-group modify` command to adjust throughput ceilings.

**Example**

The following command creates the shared policy group `pg-vs1` with a maximum throughput of 5,000 IOPS:

```
cluster1::> qos policy-group create -policy group pg-vs1 -vserver vs1 -max-throughput 5000iops -is-shared true
```

**Example**

The following command creates the non-shared policy group `pg-vs3` with a maximum throughput of 100 IOPS or 400 Kb/S:

```
cluster1::> qos policy-group create -policy group pg-vs3 -vserver vs3 -max-throughput 100iops,400KB/s -is-shared false
```

**Example**

The following command creates the non-shared policy group `pg-vs4` without a throughput limit:

```
cluster1::> qos policy-group create -policy group pg-vs4 -vserver vs4 -is-shared false
```

2. Apply a policy group to an SVM, file, volume, or LUN:

```
storage_object create -vserver SVM -qos-policy-group policy_group
```

For complete command syntax, see the man pages. You can use the `storage_object modify` command to apply a different policy group to the storage object.

**Example**

The following command applies policy group `pg-vs1` to SVM `vs1`:

```
cluster1::> vserver create -vserver vs1 -qos-policy-group pg-vs1
```

**Example**

The following commands apply policy group `pg-app` to the volumes `app1` and `app2`:

```
cluster1::> volume create -vserver vs2 -volume app1 -aggregate aggr1 -qos-policy-group pg-app
```

```
cluster1::> volume create -vserver vs2 -volume app2 -aggregate aggr1 -qos-policy-group pg-app
```

<https://docs.netapp.com/ontap-9/index.jsp?topic=/com.netapp.doc.pow-perf-mon/GUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html>.

## 3. Monitor policy group performance:

```
qos statistics performance show
```

For complete command syntax, see the man page.

---

**Note:** Monitor performance from the cluster. Do not use a tool on the host to monitor performance.

**Example**

The following command shows policy group performance:

```
cluster1::> qos statistics performance show
Policy Group      IOPS      Throughput   Latency
-----
-total-          12316     47.76MB/s  1264.00us
pg_vsl           5008      19.56MB/s   2.45ms
_System-Best-Effort   62      13.36KB/s   4.13ms
_System-Background  30       0KB/s      0ms
```

## 4. Monitor workload performance:

```
qos statistics workload performance show
```

For complete command syntax, see the man page.

---

**Note:** Monitor performance from the cluster. Do not use a tool on the host to monitor performance.

**Example**

The following command shows workload performance:

```
cluster1::> qos statistics workload performance show
Workload      ID      IOPS      Throughput   Latency
-----
-total-          -     12320     47.84MB/s  1215.00us
appl-wid7967    7967    7219     28.20MB/s  319.00us
vs1-wid12279   12279    5026     19.63MB/s  2.52ms
_USERSPACE_APPS 14      55      10.92KB/s  236.00us
_Scan_Backgro.. 5688     20       0KB/s      0ms
```

---

**Note:** You can use the `qos statistics workload latency show` command to view detailed latency statistics for QoS workloads.

<https://docs.netapp.com/ontap-9/index.jsp?topic=/com.netapp.doc.pow-perf-mon/GUID-77DF9BAF-4ED7-43F6-AECE-95DFB0680D2F.html>.